Appendix A
Glossary

A

AAL	ATM adaptation layer. A series of protocols enabling various types of traffic, including voice, data, image, and video, to run over an ATM network.
active route	Route chosen from all routes in the routing table to reach a destination. Active routes are installed into the forwarding table.
add/drop multiplexer	*See* ADM .
Address Resolution Protocol	*See* ARP .
adjacency	Portion of the local routing information that pertains to the reachability of a single neighbor over a single circuit or interface.
ADM	Add/drop multiplexer. SONET functionality that allows lower-level signals to be dropped from a high-speed optical connection.
aggregation	Combination of groups of routes that have common addresses into a single entry in the routing table.
AH	Authentication Header. A component of the IPSec protocol used to verify that the contents of a packet have not been changed, and to validate the identity of the sender. *See also* ESP .
ANSI	American National Standards Institute. The United States' representative to the ISO.
APQ	Alternate Priority Queuing. Dequeuing method that has a special queue, similar to SPQ, which is visited only 50 percent of the time. The packets in the special queue still have a predictable latency, although the upper limit of the delay is higher than that with SPQ. Since the other configured queues share the remaining 50 percent of the service time, queue starvation is usually avoided. *See also* SPQ .
APS	Automatic Protection Switching. Technology used by SONET ADMs to protect against circuit faults between the ADM and a router and to protect against failing routers.
area	Routing subdomain that maintains detailed routing information about its own internal composition and that maintains routing information that allows it to reach other routing subdomains. In IS-IS, an area corresponds to a Level 1 subdomain.
	In IS-IS and OSPF, a set of contiguous networks and hosts within an autonomous system that have been administratively grouped together.
area border router	Router that belongs to more than one area. Used in OSPF.

ARP	Address Resolution Protocol. Protocol for mapping IP addresses to MAC addresses.
AS	Autonomous system. Set of routers under a single technical administration. Each AS normally uses a single interior gateway protocol (IGP) and metrics to propagate routing information within the set of routers. Also called *routing domain* .
AS boundary router	In OSPF, routers that exchange routing information with routers in other ASs.
AS external link advertisements	OSPF link-state advertisement sent by AS boundary routers to describe external routes that they know. These link-state advertisements are flooded throughout the AS (except for stub areas).
AS path	In BGP, the route to a destination. The path consists of the AS numbers of all routers a packet must go through to reach a destination.
ASIC	Application-specific integrated circuit. Specialized processors that perform specific functions on the router.
ATM	Asynchronous Transfer Mode. A high-speed multiplexing and switching method utilizing fixed-length cells of 53 octets to support multiple types of traffic.
atomic	Smallest possible operation. An atomic operation is performed either entirely or not at all. For example, if machine failure prevents a transaction from completing, the system is rolled back to the start of the transaction, with no changes taking place.
Authentication Header	*See* AH .
Automatic Protection Switching	*See* APS .
autonomous system	*See* AS .
autonomous system boundary router	In OSPF, routers that exchange routing information with routers in other ASs.
autonomous system external link advertisements	OSPF link-state advertisement sent by autonomous system boundary routers to describe external routes that they know. These link-state advertisements are flooded throughout the autonomous system (except for stub areas).
autonomous system path	In BGP, the route to a destination. The path consists of the autonomous system numbers of all the routers a packet must pass through to reach a destination.

B

backbone area	In OSPF, an area that consists of all networks in area ID 0.0.0.0, their attached routers, and all area border routers.
backplane	On an M40 router, component of the Packet Forwarding Engine that distributes power, provides signal connectivity, manages shared memory on FPCs, and passes outgoing data cells to FPCs.
bandwidth	The range of transmission frequencies a network can use, expressed as the difference between the highest and lowest frequencies of a transmission channel. In computer networks, greater bandwidth indicates faster data-transfer rate capacity.
Bellcore	Bell Communications Research. Research and development organization created after the divestiture of the Bell System. It is supported by the regional Bell holding companies (RBHCs), which own the regional Bell operating companies (RBOCs).

BERT   Bit error rate test. A test that can be run on a T3 interface to determine whether it is operating properly.

BGP   Border Gateway Protocol. Exterior gateway protocol used to exchange routing information among routers in different autonomous systems.

bit error rate test   *See* BER T .

BITS   Building Integrated Timing Source. Dedicated timing source that synchronizes all equipment in a particular building.

Border Gateway Protocol   *See* BGP .

broadcast   Operation of sending network traffic from one network node to all other network nodes.

bundle   Collection of software that makes up a JUNOS software release.

C

CB   Control Board. Part of the host subsystem that provides control and monitoring functions for router components.

CCC   Circuit cross-connect. A JUNOS software feature that allows you to configure transparent connections between two circuits, where a circuit can be a Frame Relay DLCI, an ATM VC, a PPP interface, a Cisco HDLC interface, or an MPLS label-switched path (LSP).

CE device   Customer edge device. Router or switch in the customer's network that is connected to a service provider's provider edge (PE) router and participates in a Layer 3 VPN.

CFM   Cubic feet per minute. Measure of air flow in volume per minute.

Challenge Handshake Authentication Protocol   *See* CHAP .

channel service unit   *See* CSU/DSU .

CHAP   A protocol that authenticates remote users. CHAP is a server-driven, three-step authentication mechanism that depends on a shared secret password that resides on both the server and the client.

CIDR   Classless interdomain routing. A method of specifying Internet addresses in which you explicitly specify the bits of the address to represent the network address instead of determining this information from the first octet of the address.

CIP   Connector Interface Panel. On an M160 router, the panel that contains connectors for the Routing Engines, BITS interfaces, and alarm relay contacts.

circuit cross-connect   *See* CCC .

class of service   *See* CoS .

CLEC   (Pronounced "see-lek") Competitive Local Exchange Carrier. Company that competes with the already established local telecommunications business by providing its own network and switching.

CLEI   Common language equipment identifier. Inventory code used to identify and track telecommunications equipment.

CLI   Command-line interface. Interface provided for configuring and monitoring the routing protocol software.

client peer   In a BGP route reflection, a member of a cluster that is not the route reflector. *See also* nonclient peer   .

CLNP   Connectionless Network Protocol. ISO-developed protocol for OSI connectionless network service. CLNP is the OSI equivalent of IP.

cluster   In BGP, a set of routers that have been grouped together. A cluster consists of one system that acts as a route reflector, along with any number of client peers. The client peers receive their route information only from the route reflector system. Routers in a cluster do not need to be fully meshed.

community   In BGP, a group of destinations that share a common property. Community information is included as one of the path attributes in BGP update messages.

confederation   In BGP, a group of systems that appears to external autonomous systems to be a single autonomous system.

constrained path   In traffic engineering, a path determined using RSVP signaling and constrained using CSPF. The ERO carried in the packets contains the constrained path information.

core   The central backbone of the network.

CoS   Class of service. The method of classifying traffic on a packet-by-packet basis using information in the ToS byte to provide different service levels to different traffic.

CPE   Customer premises equipment. Telephone or other service provider equipment located at a customer site.

craft interface   Mechanisms used by a Communication Workers of America craftsperson to operate, administer, and maintain equipment or provision data communications. On a Juniper Networks router, the craft interface allows you to view status and troubleshooting information and perform system control functions.

CSCP   Class Selector Codepoint.

CSNP   Complete sequence number PDU. Packet that contains a complete list of all the LSPs in the IS-IS database.

CSPF   Constrained Shortest Path First. An MPLS algorithm that has been modified to take into account specific restrictions when calculating the shortest path across the network.

CSU/DSU   Channel service unit/data service unit. Channel service unit connects a digital phone line to a multiplexer or other digital signal device. Data service unit connects a DTE to a digital phone line.

customer edge device   *See* CE de   vice   .

D   **daemon**   Background process that performs operations on behalf of the system software and hardware. Daemons normally start when the system software is booted, and they run as long as the software is running. In the JUNOS software, daemons are also referred to as processes.

damping   Method of reducing the number of update messages sent between BGP peers, thereby reducing the load on these peers without adversely affecting the route convergence time for stable routes.

data circuit-terminating equipment   *See* DCE .

data-link connection identifier   *See* DLCI .

data service unit   *See* CSU/DSU .

Data Terminal Equipment   *See* DTE .

dcd   The JUNOS software interface process (daemon).

DCE   Data circuit-terminating equipment. RS-232-C device, typically used for a modem or printer, or a network access and packet switching node.

default address   Router address that is used as the source address on unnumbered interfaces.

denial of service   *See* DoS .

dense wavelength-division multiplexing   *See* D WDM .

designated router   In OSPF, a router selected by other routers that is responsible for sending link-state advertisements that describe the network, which reduces the amount of network traffic and the size of the routers' topological databases.

destination prefix length   Number of bits of the network address used for host portion of a CIDR IP address.

DHCP   Dynamic Host Configuration Protocol. Allocates IP addresses dynamically so that they can be reused when they are no longer needed.

Diffie-Hellman   A public key scheme, invented by Whitfield Diffie and Martin Hellman, used for sharing a secret key without communicating secret information, thus precluding the need for a secure channel. Once correspondents have computed the secret shared key, they can use it to encrypt communications.

Diffserv   Differentiated Service (based on RFC 2474). Diffserv uses the ToS byte to identify different packet flows on a packet-by-packet basis. Diffserv adds a Class Selector Codepoint (CSCP) and a Differentiated Services Codepoint (DSCP).

Dijkstra algorithm   *See* SPF .

DIMM   Dual inline memory module. 168-pin memory module that supports 64-bit data transfer.

direct routes   *See* interf ace routes .

DLCI Data-link connection identifier. Identifier for a Frame Relay virtual connection (also called a logical interface).

DoS Denial of service. System security breach in which network services become unavailable to users.

DRAM Dynamic random-access memory. Storage source on the router that can be accessed quickly by a process.

drop profile Drop probabilities for different levels of buffer fullness that are used by RED to determine from which queue to drop packets.

DSCP Differentiated Services Codepoint.

DSU Data service unit. A device used to connect a DTE to a digital phone line. Converts digital data from a router to voltages and encoding required by the phone line. *See also* CSU/DSU .

DTE Data Terminal Equipment. RS-232-C interface that a computer uses to exchange information with a serial device.

DVMRP Distance Vector Multicast Routing Protocol. Distributed multicast routing protocol that dynamically generates IP multicast delivery trees using a technique called reverse path multicasting (RPM) to forward multicast traffic to downstream interfaces.

DWDM Dense wavelength-division multiplexing. Technology that enables data from different sources to be carried together on an optical fiber, with each signal carried on its own separate wavelength.

Dynamic Host Configuration Protocol *See* DHCP .

E

EBGP External BGP. BGP configuration in which sessions are established between routers in different ASs.

ECSA Exchange Carriers Standards Association. A standards organization created after the divestiture of the Bell System to represent the interests of interexchange carriers.

edge router In MPLS, a router located at the beginning or end of a label-switching tunnel. When at the beginning of a tunnel, an edge router applies labels to new packets entering the tunnel. When at the end of a tunnel, the edge router removes labels from packets exiting the tunnel. *See also* MPLS .

EGP Exterior gateway protocol, such as BGP.

egress router In MPLS, last router in a label-switched path (LSP). *See also* ingress router .

EIA Electronic Industries Association. A United States trade group that represents manufacturers of electronics devices and sets standards and specifications.

EMI Electromagnetic interference. Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics or electrical equipment.

encapsulating security payload *See* ESP .

end system In IS-IS, network entity that sends and receives packets.

ERO   Explicit Route Object. Extension to RSVP that allows an RSVP PATH message to traverse an explicit sequence of routers that is independent of conventional shortest-path IP routing.

ESP   Encapsulating security payload. A fundamental component of IPSec-compliant VPNs, ESP specifies an IP packet's encryption, data integrity checks, and sender authentication, which are added as a header to the IP packet. *See also* AH .

explicit path   *See* signaled path   .

Explicit Route Object   *See* ER O .

export   To place routes from the routing table into a routing protocol.

external BGP   *See* EBGP   .

external metric   A cost included in a route when OSPF exports route information from external autonomous systems. There are two types of external metrics: Type 1 and Type 2. Type 1 external metrics are equivalent to the link-state metric; that is, the cost of the route, used in the internal autonomous system. Type 2 external metrics are greater than the cost of any path internal to the autonomous system.

F

fast reroute   Mechanism for automatically rerouting traffic on an LSP if a node or link in an LSP fails, thus reducing the loss of packets traveling over the LSP.

FEAC   Far-end alarm and control. T3 signal used to send alarm or status information from the far-end terminal back to the near-end terminal and to initiate T3 loopbacks at the far-end terminal from the near-end terminal.

FEB   Forwarding Engine Board. In M5 and M10 routers, provides route lookup, filtering, and switching to the destination port.

firewall   A security gateway positioned between two different networks, usually between a trusted network and the Internet. A firewall ensures that all traffic that crosses it conforms to the organization's security policy. Firewalls track and control communications, deciding whether to pass, reject, discard, encrypt, or log them. Firewalls also can be used to secure sensitive portions of a local network.

FIFO   First in, first out.

flap damping   *See* damping   .

flapping   *See* route flapping   .

Flexible PIC Concentrator   *See* FPC .

Forwarding Engine Board   *See* FEB .

forwarding information base   *See* forw   arding table   .

forwarding table   JUNOS software forwarding information base (FIB). The JUNOS routing protocol process installs active routes from its routing tables into the Routing Engine forwarding table. The kernel copies this forwarding table into the Packet Forwarding Engine, which is responsible for determining which interface transmits the packets.

FPC Flexible PIC Concentrator. An interface concentrator on which PICs are mounted. An FPC inserts into a slot in a Juniper Networks router. *See also* PIC .

FRU Field-replaceable unit. Router component that customers can replace onsite.

group A collection of related BGP peers.

hash A one-way function that takes a message of any length and produces a fixed-length digest. In security, a message digest is used to validate that the contents of a message have not been altered in transit. The Secure Hash Algorithm (SHA-1) and Message Digest 5 (MD5) are commonly used hashes.

Hashed Message Authentication Code *See* HMA C .

HDLC High-level data link control. An International Telecommunication Union (ITU) standard for a bit-oriented data link layer protocol on which most other bit-oriented protocols are based.

HMAC Hashed Message Authentication Code. A mechanism for message authentication that uses cryptographic hash functions. HMAC can be used with any iterative cryptographic hash function—for example, MD5 or SHA-1—in combination with a secret shared key. The cryptographic strength of HMAC depends on the properties of the underlying hash function.

hold time Maximum number of seconds allowed to elapse between the time a BGP system receives successive keepalive or update messages from a peer.

host module On an M160 router, provides routing and system management functions of the router. Consists of the Routing Engine and Miscellaneous Control Subsystem (MCS).

host subsystem Provides routing and system-management functions of the router. Consists of a Routing Engine and an adjacent Control Board (CB).

IANA Internet Assigned Numbers Authority. Regulatory group that maintains all assigned and registered Internet numbers, such as IP and multicast addresses. *See also* NIC .

IBGP Internal BGP. BGP configuration in which sessions are established between routers in the same ASs.

ICMP Internet Control Message Protocol. Used in router discovery, ICMP allows router advertisements that enable a host to discover addresses of operating routers on the subnet.

IDE Integrated Drive Electronics. Type of hard disk on the Routing Engine.

IEC International Electrotechnical Commission. *See* ISO .

IEEE Institute of Electronic and Electrical Engineers. International professional society for electrical engineers.

IETF Internet Engineering Task Force. International community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

IGMP	Internet Group Membership Protocol. Used with multicast protocols to determine whether group members are present.
IGP	Interior gateway protocol, such as IS-IS, OSPF, and RIP.
IKE	Internet Key Exchange. The key management protocol used in IPSec, IKE combines the ISAKMP and Oakley protocols to create encryption keys and security associations.
import	To install routes from the routing protocols into a routing table.
ingress router	In MPLS, first router in a label-switched path (LSP). *See also* egress router.
inter-AS routing	Routing of packets among different ASs. *See also* EBGP.
intercluster reflection	In a BGP route reflection, the redistribution of routing information by a route reflector system to all nonclient peers (BGP peers not in the cluster). *See also* route reflection.
interface routes	Routes that are in the routing table because an interface has been configured with an IP address. Also called *direct routes*.
intermediate system	In IS-IS, network entity that sends and receives packets and that can also route packets.
internal BGP	*See* IBGP.
Internet Key Exchange	*See* IKE.
Internet Protocol Security	*See* IPSec.
Internet Security Association and Key Management Protocol	*See* ISAKMP.
intra-AS routing	The routing of packets within a single AS. *See also IBGP.*
IP	Internet Protocol. The protocol used for sending data from one point to another on the Internet.
IPSec	Internet Protocol Security. The industry standard for establishing VPNs, IPSec comprises a group of protocols and algorithms that provide authentication and encryption of data across IP-based networks.
ISAKMP	Internet Security Association and Key Management Protocol. A protocol that allows the receiver of a message to obtain a public key and use digital certificates to authenticate the sender's identity. ISAKMP is designed to be key exchange independent; that is, it supports many different key exchanges. *See also* IKE *and* Oakley.
IS-IS	Intermediate System-to-Intermediate System protocol. Link-state, interior gateway routing protocol for IP networks that also uses the shortest-path first (SPF) algorithm to determine routes.
ISO	International Organization for Standardization. Worldwide federation of standards bodies that promotes international standardization and publishes international agreements as International Standards.

ISP Internet service provider. Company that provides access to the Internet and related services.

ITU International Telecommunications Union (formerly known as the CCITT). Group supported by the United Nations that makes recommendations and coordinates the development of telecommunications standards for the entire world.

J

jitter Small random variation introduced into the value of a timer to prevent multiple timer expirations from becoming synchronized.

K

kernel forwarding table *See* forw arding table .

L

label In MPLS, 20-bit unsigned integer in the range 0 through 1048575, used to identify a packet traveling along an LSP.

label-switched path (LSP) Sequence of routers that cooperatively perform MPLS operations for a packet stream. The first router in an LSP is called the *ingress router*, and the last router in the path is called the *egress router*. An LSP is a point-to-point, half-duplex connection from the ingress router to the egress router. (The ingress and egress routers cannot be the same router.)

label switching *See* MPLS .

label-switching router *See* LSR .

link Communication path between two neighbors. A link is *up* when communication is possible between the two end points.

link-state PDU (LSP) Packets that contain information about the state of adjacencies to neighboring systems.

local preference Optional BGP path attribute carried in internal BGP update packets that indicates the degree of preference for an external route.

loose In the context of traffic engineering, a path that can use any route or any number of other intermediate (transit) points to reach the next address in the path. (Definition from RFC 791, modified to fit LSPs.)

LSP *See* label-switched path (LSP)) *or* link-state PDU (LSP) .

LSR Label-switching router. A router on which MPLS and RSVP are enabled and is thus capable of processing label-switched packets.

M

martian address Network address about which all information is ignored.

mask *See* subnet mask .

MBGP Multiprotocol BGP. An extension to BGP that allows you to connect multicast topologies within and between BGP ASs.

MBone Internet multicast backbone. An interconnected set of subnetworks and routers that support the delivery of IP multicast traffic. The MBone is a virtual network that is layered on top of sections of the physical Internet.

MCS Miscellaneous Control Subsystem. On an M160 router, provides control and monitoring functions for router components and SONET clocking for the router.

MD5 Message Digest 5. A one-way hashing algorithm that produces a 128-bit hash. It is used in AH and ESP. *See also* SHA-1 .

MDRR Modified Deficit Round Robin. A method for selecting queues to be serviced.

MED Multiple exit discriminator. Optional BGP path attribute consisting of a metric value that is used to determine the exit point to a destination when all other factors in determining the exit point are equal.

mesh Network topology in which devices are organized in a manageable, segmented manner with many, often redundant, interconnections between network nodes.

Message Digest 5 *See* MD5 .

MIB Management Information Base. Definition of an object that can be managed by SNMP.

midplane Forms the rear of the PIC cage on M5 and M10 routers and the FPC card cage on M20 and M160 routers. Provides data transfer, power distribution, and signal connectivity.

Miscellaneous Control Subsystem *See* MCS .

MPLS Multiprotocol Label Switching. Mechanism for engineering network traffic patterns that functions by assigning to network packets short labels that describe how to forward them through the network. Also called *label switching*. *See also* traf fic engineering .

MTBF Mean time between failure. Measure of hardware component reliability.

MTU Maximum transfer unit. Limit on segment size for a network.

multicast Operation of sending network traffic from one network node to multiple network nodes.

multicast distribution tree The data path between the sender (host) and the multicast group member (receiver or listener).

multiprotocol BGP *See* MBGP .

Multiprotocol Label Switching *See* MPLS .

N neighbor Adjacent system reachable by traversing a single subnetwork. An immediately adjacent router. Also called a *peer*.

NET Network entity title. Network address defined by the ISO network architecture and used in CLNS-based networks.

network layer reachability information *See* NLRI .

network link advertisement An OSPF link-state advertisement flooded throughout a single area by designated routers to describe all routers attached to the network.

Network Time Protocol	*See* NTP .
NIC	Network Information Center. Internet authority responsible for assigning Internet-related numbers, such as IP addresses and autonomous system numbers. *See also* IAN A .
NLRI	Network layer reachability information. Information that is carried in BGP packets and is used by MBGP.
nonclient peer	In a BGP route reflection, a BGP peer that is not a member of a cluster. *See also* client peer .
not-so-stubby area	*See* NSSA .
NSAP	Network service access point. Connection to a network that is identified by a network address.
n-selector	Last byte of an nonclient peer address.
NSSA	Not-so-stubby area. In OSPF, a type of stub area in which external routes can be flooded.
NTP	Network Time Protocol. Protocol used to synchronize computer clock times on a network.

O

Oakley	A key determination protocol based on the Diffie-Hellman algorithm that provides added security, including authentication. Oakley was the key-exchange algorithm mandated for use with the initial version of ISAKMP, although various algorithms can be used. Oakley describes a series of key exchanges called "modes" and details the services provided by each; for example, Perfect Forward Secrecy for keys, identity protection, and authentication. *See also* ISAKMP .
OC	Optical Carrier. In SONET, Optical Carrier levels indicate the transmission rate of digital signals on optical fiber.
OSI	Open System Interconnection. Standard reference model for how messages are transmitted between two points on a network.
OSPF	Open Shortest Path First. A link-state IGP that makes routing decisions based on the shortest-path-first (SPF) algorithm (also referred to as the *Dijkstra algorithm*).

P

package	A collection of files that make up a JUNOS software component.
Packet Forwarding Engine	The architectural portion of the router that processes packets by forwarding them between input and output interfaces.
path attribute	Information about a BGP route, such as the route origin, AS path, and next-hop router.
PCI	Peripheral Component Interconnect. Standard, high-speed bus for connecting computer peripherals. Used on the Routing Engine.
PCMCIA	Personal Computer Memory Card International Association. Industry group that promotes standards for credit card-size memory or I/O devices.
PDU	Protocol data unit. IS-IS packets.
PE router	Provider edge router. A router in the service provider's network that is connected to a customer edge (CE) device and that participates in a Virtual Private Network (VPN).

PEC	Policing Equivalence Classes. In traffic policing, a set of packets that is treated the same by the packet classifier.
peer	An immediately adjacent router with which a protocol relationship has been established. Also called a *neighbor*.
Perfect Forward Secrecy	*See* PFS .
PFE	*See* Pack et F orw arding Engine .
PFS	A condition derived from an encryption system that changes encryption keys often and ensures that no two sets of keys have any relation to each other. The advantage of PFS is that if one set of keys is compromised, only communications using those keys are at risk. An example of a system that uses PFS is Diffie-Hellman.
Physical Interface Card	*See* PIC .
PIC	Physical Interface Card. A network interface–specific card that can be installed on an FPC in the router.
PIM	Protocol Independent Multicast. A protocol-independent multicast routing protocol. PIM Sparse Mode routes to multicast groups that might span wide-area and interdomain internets. PIM Dense Mode is a flood-and-prune protocol.
PLP	Packet Loss Priority.
PLP bit	Packet Loss Priority bit. Used to identify packets that have experienced congestion or are from a transmission that exceeded a service provider's customer service license agreement. This bit can be used as part of a router's congestion control mechanism and can be set by the interface or by a filter.
policing	Applying rate limits on bandwidth and burst size for traffic on a particular interface.
pop	Removal of the last label, by a router, from a packet as it exits an MPLS domain.
PPP	Point-to-Point Protocol. Link-layer protocol that provides multiprotocol encapsulation. It is used for link-layer and network-layer configuration.
precedence bits	The first three bits in the ToS byte. On a Juniper Networks router, these bits are used to sort or classify individual packets as they arrive at an interface. The classification determines the queue to which the packet is directed upon transmission.
preference	Desirability of a route to become the active route. A route with a lower preference value is more likely to become the active route. The preference is an arbitrary value in the range 0 through 255 that the routing protocol process uses to rank routes received from different protocols, interfaces, or remote systems.
preferred address	On an interface, the default local address used for packets sourced by the local router to destinations on the subnet.
primary address	On an interface, the address used by default as the local address for broadcast and multicast packets sourced locally and sent out the interface.
primary interface	Router interface that packets go out when no interface name is specified and when the destination address does not imply a particular outgoing interface.

Protocol-Independent Multicast	*See* PIM .
provider edge router	*See* PE router .
provider router	Router in the service provider's network that does not attach to a customer edge (CE) device.
PSNP	Partial sequence number PDU. Packet that contains only a partial list of the LSPs in the IS-IS link-state database.
push	Addition of a label or stack of labels, by a router, to a packet as it enters an MPLS domain.

Q

QoS	Quality of service. Performance, such as transmission rates and error rates, of a communications channel or system.
quality of service	*See* QoS .

R

RADIUS	Remote Authentication Dial-In User Service. Authentication method for validating users who attempt to access the router using Telnet.
Random Early Detection	*See* RED .
rate limiting	*See* policing .
RBOC	(Pronounced "are-bock") Regional Bell operating company. Regional telephone companies formed as a result of the divestiture of the Bell System.
RDRAM	RAMBUS dynamic random access memory.
RED	Random Early Detection. Gradual drop profile for a given class that is used for congestion avoidance. RED tries to anticipate incipient congestion and reacts by dropping a small percentage of packets from the head of the queue to ensure that a queue never actually becomes congested.
Rendezvous Point	*See* RP .
Resource Reservation Protocol	*See* RSVP .
RFC	Request for Comments. Internet standard specifications published by the Internet Engineering Task Force.
RFI	Radio frequency interference. Interference from high-frequency electromagnetic waves emanating from electronic devices.
RIP	Routing Information Protocol. Distance-vector interior gateway protocol that makes routing decisions based on hop count.
route flapping	Situation in which BGP systems send an excessive number of update messages to advertise network reachability information.
route identifier	IP address of the router from which a BGP, IGP, or OSPF packet originated.

route reflection In BGP, configuring a group of routers into a cluster and having one system act as a route reflector, redistributing routes from outside the cluster to all routers in the cluster. Routers in a cluster do not need to be fully meshed.

router link advertisement OSPF link-state advertisement flooded throughout a single area by all routers to describe the state and cost of the router's links to the area.

routing domain *See* AS .

Routing Engine Architectural portion of the router that handles all routing protocol processes, as well as other software processes that control the router's interfaces, some of the chassis components, system management, and user access to the router.

routing instance A collection of routing tables, interfaces, and routing protocol parameters. The set of interfaces belongs to the routing tables and the routing protocol parameters control the information in the routing tables.

routing table Common database of routes learned from one or more routing protocols. All routes are maintained by the JUNOS routing protocol process.

RP For PIM-SM, a core router acting as the root of the distribution tree in a shared tree.

rpd JUNOS software routing protocol process (daemon). User-level background process responsible for starting, managing, and stopping the routing protocols on a Juniper Networks router.

RPM Reverse path multicasting. Routing algorithm used by DVMRP to forward multicast traffic.

RSVP Resource Reservation Protocol. Resource reservation setup protocol designed to interact with integrated services on the Internet.

S

SA Security association. An IPSec term that describes an agreement between two parties about what rules to use for authentication and encryption algorithms, key exchange mechanisms, and secure communications.

SAP Session Announcement Protocol. Used with multicast protocols to handle session conference announcements.

SAR Segmentation and reassembly. Buffering used with ATM.

SCB System Control Board. On an M40 router, the part of the Packet Forwarding Engine that performs route lookups, monitors system components, and controls FPC resets.

SCG SONET Clock Generator. Provides Stratum 3 clock signal for the SONET/SDH interfaces on the router. Also provides external clock inputs.

SDH Synchronous Digital Hierarchy. CCITT variation of SONET standard.

SDP Session Description Protocol. Used with multicast protocols to handle session conference announcements.

SDRAM Synchronous dynamic random access memory.

Secure Hash Algorithm *See* SHA-1 .

secure shell *See* SSH .

security association	*See* SA .
Security Parameter Index	*See* SPI .
SFM	Switching and Forwarding Module. On an M160 router, a component of the Packet Forwarding Engine that provides route lookup, filtering, and switching to FPCs.
SHA-1	Secure Hash Algorithm. A widely used hash function for use with Digital Signal Standard (DSS). SHA-1 is more secure than MD5.
shortest-path-first algorithm	*See* SPF .
signaled path	In traffic engineering, an explicit path; that is, a path determined using RSVP signaling. The ERO carried in the packets contains the explicit path information.
SIB	Switch Interface Board. Provides the switching function to the destination Packet Forwarding Engine.
simplex interface	An interface that assumes that packets it receives from itself are the result of a software loopback process. The interface does not consider these packets when determining whether the interface is functional.
SNMP	Simple Network Management Protocol. Protocol governing network management and the monitoring of network devices and their functions.
SONET	Synchronous Optical Network. High-speed (up to 2.5 Gbps) synchronous network specification developed by Bellcore and designed to run on optical fiber. STS-1 is the basic building block of SONET. Approved as an international standard in 1988. *See also* SDH .
SPF	Shortest-path first, an algorithm used by IS-IS and OSPF to make routing decisions based on the state of network links. Also called the *Dijkstra algorithm*.
SPI	Security Parameter Index. A portion of the IPSec Authentication Header that communicates which security protocols, such as authentication and encryption, are used for each packet in a VPN connection.
SPQ	Strict Priority Queuing. Dequeuing method that provides a special queue that is serviced until it is empty. The traffic sent to this queue tends to maintain a lower latency and more consistent latency numbers than traffic sent to other queues. *See also* APQ .
SSB	System and Switch Board. On an M20 router, Packet Forwarding Engine component that performs route lookups and component monitoring and monitors FPC operation.
SSH	Secure shell. Software that provides a secured method of logging in to a remote network system.
SSRAM	Synchronous Static Random Access Memory.
static LSP	*See* static path .
static path	In the context of traffic engineering, a static route that requires hop-by-hop manual configuration. No signaling is used to create or maintain the path. Also called a *static LSP*.
STM	Synchronous Transport Module. CCITT specification for SONET at 155.52 Mbps.

strict In the context of traffic engineering, a route that must go directly to the next address in the path. (Definition from RFC 791, modified to fit LSPs.)

STS Synchronous Transport Signal. Synchronous Transport Signal level 1. Basic building block signal of SONET, operating at 51.84 Mbps. Faster SONET rates are defined as STS-n, where n is a multiple of 51.84 Mbps. *See also* SONET .

stub area In OSPF, an area through which, or into which, AS external advertisements are not flooded.

subnet mask Number of bits of the network address used for host portion of a Class A, Class B, or Class C IP address.

summary link advertisement OSPF link-statement advertisement flooded throughout the advertisement's associated areas by area border routers to describe the routes that they know about in other areas.

sysid System identifier. Portion of the ISO nonclient peer. The sysid can be any 6 bytes that are unique throughout a domain.

System and Switch Board *See* SSB .

T

TACACS+ Terminal Access Controller Access Control System Plus. Authentication method for validating users who attempt to access the router using Telnet.

TCP Transmission Control Protocol. Works in conjunction with Internet Protocol (IP) to send data over the Internet. Divides a message into packets and tracks the packets from point of origin to destination.

ToS Type of service. The method of handling traffic using information extracted from the fields in the ToS byte to differentiate packet flows.

traffic engineering Process of selecting the paths chosen by data traffic in order to balance the traffic load on the various links, routers, and switches in the network. (Definition from http://www.ietf.org/internet-drafts/draft-ietf-mpls-framework-04.txt.) *See also* MPLS .

transit area In OSPF, an area used to pass traffic from one adjacent area to the backbone or to another area if the backbone is more than two hops away from an area.

transit router In MPLS, any intermediate router in the LSP between the ingress router and the egress router.

transport mode An IPSec mode of operation in which the data payload is encrypted, but the original IP header is left untouched. The IP addresses of the source or destination can be modified if the packet is intercepted. Because of its construction, transport mode can be used only when the communication endpoint and cryptographic endpoint are the same. VPN gateways that provide encryption and decryption services for protected hosts cannot use transport mode for protected VPN communications. *See also* tunnel mode .

Triple-DES A 168-bit encryption algorithm that encrypts data blocks with three different keys in succession, thus achieving a higher level of encryption. Triple-DES is one of the strongest encryption algorithms available for use in VPNs.

tunnel Private, secure path through an otherwise public network.

tunnel mode An IPSec mode of operation in which the entire IP packet, including the header, is encrypted and authenticated and a new VPN header is added, protecting the entire original packet. This mode can be used by both VPN clients and VPN gateways, and protects communications that come from or go to non-IPSec systems. *See also* transport mode .

Tunnel PIC A physical interface card that allows the router to perform the encapsulation and decapsulation of IP datagrams. The Tunnel PIC supports IP-IP, GRE, and PIM register encapsulation and decapsulation. When the Tunnel PIC is installed, the router can be a PIM rendezvous point (RP) or a PIM first-hop router for a source that is directly connected to the router.

type of service *See* ToS .

U

unicast Operation of sending network traffic from one network node to another individual network node.

UPS Uninterruptible power supply. Device that sits between a power supply and a router (or other piece of equipment) the prevents undesired power-source events, such as outages and surges, from affecting or damaging the device.

V

vapor corrosion inhibitor *See* VCI .

VCI Vapor corrosion inhibitor. Small cylinder packed with the router that prevents corrosion of the chassis and components during shipment.

VCI Virtual circuit identifier. 16-bit field in the header of an ATM cell that indicates the particular virtual circuit the cell takes through a virtual path. Also called a *logical interface. See also VPI.*

virtual circuit identifier *See* VCI .

virtual link In OSPF, a link created between two routers that are part of the backbone but are not physically contiguous.

virtual path identifier *See* VPI .

virtual private network *See* VPN .

Virtual Router Redundancy Protocol *See* VRRP .

VPI virtual path identifier. 8-bit field in the header of an ATM cell that indicates the virtual path the cell takes. *See also* VCI .

VPN virtual private network. A private data network that makes use of a public TCP/IP network, typically the Internet, while maintaining privacy with a tunneling protocol, encryption, and security procedures.

VRRP Virtual Router Redundancy Protocol. On Fast Ethernet and Gigabit Ethernet interfaces, allows you to configure virtual default routers.

W

wavelength-division multiplexing	*See* WDM .
WDM	Wavelength-division multiplexing. Technique for transmitting a mix of voice, data, and video over various wavelengths (colors) of light.
WFQ	Weighted Fair Queuing.
weighted round-robin	*See* WRR .
WRR	Weighted round-robin. Scheme used to decide the queue from which the next packet should be transmitted.